Asymmetric In-Loop Filters At Virtual Boundaries

TECHNICAL FIELD

[0001] The examples and non-limiting embodiments relate generally to multimedia transport and information encoding and decoding, more particularly, to asymmetric in-loop filters at virtual boundaries.

BACKGROUND

[0002] It is known to perform data compression and decoding in a multimedia system.

SUMMARY

[0002a] In an aspect, the present disclosure refers to an apparatus comprising: at least one processor; and at least one memory including computer program code; wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus at least to: determine a virtual boundary that separates a picture, or a portion of the picture, into a first area and a second area; and determine to perform filtering of at least one pixel of the first area with coding information of the second area derived from the first area or with the coding information of the second area set to at least one value, when the coding information of the second area is to be used to perform the filtering of the at least one pixel of the first area, or determine to not perform the filtering of the at least one pixel of the first area, when the coding information of the second area is to be used to perform the filtering of the at least one pixel of the first area.

[0002b] In another aspect, the present disclosure refers to a method comprising: determining a virtual boundary that separates a picture, or a portion of the picture, into a first area and a second area; and determining to perform filtering of at least one pixel of the first area with coding information of the second area derived from the first area or with the coding information of the second area set to at least one value, when the coding information of the second area is to be used to perform the filtering

of the at least one pixel of the first area, or determining to not perform the filtering of the at least one pixel of the first area, when the coding information of the second area is to be used to perform the filtering of the at least one pixel of the first area.

[0002c] In yet another aspect, the present disclosure refers to an apparatus comprising: means for determining a virtual boundary that separates a picture, or a portion of the picture, into a first area and a second area; and means for, determining to perform filtering of at least one pixel of the first area with coding information of the second area derived from the first area or with the coding information of the second area set to at least one value, when the coding information of the second area is to be used to perform the filtering of the at least one pixel of the first area, or determining to not perform the filtering of the at least one pixel of the first area, when the coding information of the second area is to be used to perform the filtering of the at least one pixel of the first area.

[0002d] In yet another aspect, the present disclosure refers to a non-transitory program storage device readable by a machine, tangibly embodying a program of instructions executable with the machine for performing operations, the operations comprising: determining a virtual boundary that separates a picture, or a portion of the picture, into a first area and a second area; and determining to perform filtering of at least one pixel of the first area with coding information of the second area derived from the first area or with the coding information of the second area set to at least one value, when the coding information of the second area is to be used to perform the filtering of the at least one pixel of the first area, or determining to not perform the filtering of the at least one pixel of the first area, when the coding information of the second area is to be used to perform the filtering of the at least one pixel of the first area.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The foregoing aspects and other features are explained in the following description, taken in connection with the accompanying drawings, wherein:

[0004] FIG. 1 shows schematically an electronic device employing embodiments of the examples described herein.

[0005] FIG. 2 shows schematically a user equipment suitable for employing embodiments of the examples described herein.

[0006] FIG. 3 further shows schematically electronic devices employing embodiments of the examples described herein connected using wireless and wired network connections.

[0007] FIG. 4 shows schematically a block chart of an encoder used for data compression on a general level.

[0008] FIG. 5 illustrates that a refreshed are is not allowed to use coding information of a non-refreshed area.

[0009] FIG. 6 illustrates that a non-refreshed area is allowed to use coding information of a refreshed area.

[0010] FIG. 7 shows that deblocking may not be applied to pixels $p_i, i = 0,1,2,$ or still applied with pixels $q_i, i = 0,1,2,$ in the non-refreshed area padded.